Case study

TUBERCULOUS MENINGITIS: A CASE REPORT

Abstract

Introduction: The most common cause of tuberculous meningitis is a hematogenous spread of mycobacteria from the lungs. tuberculous meningitis is a fatal disease. Symptoms typically worsen over time, and there are three clinical stages to the disease (prodromal phase, phase of neurological symptoms and phase of paresis) **Case Presentation:** The chief complaint of a one-year-old boy was fever, irritability, vomiting, and Generalized Tonic-Clonic Seizure convulsions. The patient's pupils were found to be unequal on physical examination, prompting a repeat neuroimaging. It was done on MRI (magnetic resonance imaging) with T1 hyperintensity on T2 and restricted diffusion on DWI (diffusion-weighted imaging) he has not improved after taking treatment and the patient is on a ventilator as well, we nasogastric tube also. I was receiving treatment and will continue to do so until the end of my care. **Conclusion:** In our environment, tuberculous meningitis that presents late is not uncommon. It arrived late at our medical facility. After a full recovery, the patient's comprehensive health care team collaborates to help him regain his previous level of independence and satisfaction. This report is intended to raise clinician awareness of tuberculous meningitis' unusual clinical presentation. Tuberculous meningitis is treated holistically with a focus on medical and nursing management.

Keywords: Tuberculous, Meningitis, Nasogastric tube, Ventilator.

INTRODUCTION:

In developing countries, tuberculosis is one of the most common infections. Tuberculosis is most commonly diagnosed as a primary pulmonary disease. It can manifest as a disseminated form with frequent involvement of the central nervous system. In patients with Tuberculous meningitis, tuberculoma is a rare finding. Tuberculomas can be present or develop after a diagnosis.[1]

Mycobacterium tuberculosis causes a very common human infection all over the world. Latent tuberculosis affects one-third of the world's population. These people are not clinically affected, but they have a 10% lifetime risk of developing active disease.

It is a significant global health issue. Globally, it is estimated that 10.4 million new cases of Tuberculous meningitis have occurred. It is the most lethal form of tuberculosis, with children having the highest mortality rate.[2]

Tuberculous meningitis (TBM) is a two-step process. Bacilli of Mycobacterium tuberculosis enter the host through droplet inhalation. The localized infection spreads to the regional lymph nodes after spreading within the lungs. Bacilli seed to the meninges or brain parenchyma in people who develop Tuberculous meningitis TBM, resulting in small subpial or subependymal foci of metastatic caseous lesions., termed Rich foci. The growth of a Rich focus until it ruptures into the subarachnoid space is the second step in the development of Tuberculous meningitis. The type of Central Nervous System involvement is determined by the location of the expanding tubercle (i.e., Rich focus). Meningitis is caused by tubercles rupturing into the subarachnoid space.[3]

It can strike at any age, usually within a year of primary tuberculosis infection, and may be accompanied by miliary tuberculosis. Although the number of tuberculosis meningitis cases and mortality rates have decreased, survivors are usually affected by a variety of neurological complications.[4]

PATIENT INFORMATION:

A one-year-old boy was taken to Acharya Vinoba Bhave Rural Hospital with fever, irritability, vomiting, and Generalised Tonic-Clonic Seizures convulsions as his main complaints. Tuberculous Meningitis was discovered. His condition did not improve as a result of treatment. and the patient's condition was precarious. He did not respond to the nasogastric tube, which was used to take juices, etc., and the patient was intubated and placed on ventilator support. The patient's family is from a middle-class background. There were no

communicable or non-communicable diseases in their family. They had good relationships with their neighbors, and their family members had good relationships with each other. Also, other relatives. When he is admitted, his body temperature is (103 degrees Fahrenheit) and a ryle tube is inserted. Complete blood count, magnetic resonance imaging, Electroencephalogram, and intravenous fluid administration, among other drugs.

PHYSICAL EXAMINATION:

On physical examination, the patient will most likely have a fever, unsymmetrical head size, nuchal rigidity (which may or may not be present), neurological deficits, and signs of raised intracranial pressure. Also, the mental state is regarded as abnormal. Deep tendon reflexes are rarely present. Then, as soon as possible, treatment was started.

DIAGNOSTIC ASSESSMENT:

Hb-9.3 percent, total RBC count-4.13 million/cu.mm, total WBC count-13600 cu.mm, total platelet count-4.07 lacs/cu.mm, rhythmic synchronous generalized beta activity in bilateral discharges can be seen in the background of the Electroencephalogram recording. The peri mesencephalic and suprasellar cisternal bilateral Sylvian fissures were effaced in the Computed Tomography brain report. Bony calvarium, brainstem Examining the situation: - Other supportive investigations include chest X-rays to detect primary foci, X-ray skulls, CT scans, Mantoux tests, routine blood tests, particularly Electrocyte Sedimentation Rate, and newer diagnostic approaches such as biochemical markers, serodiagnosis, and molecular diagnosis. In all suspected at-risk patients, an HIV test should be performed. extra-visualized orbit and soft tissue all these appears are normal.

MEDICAL MANAGEMENT:

The patient is well-oriented to place and person upon admission. However, the patient has not responded. Then he's put on a ventilator and a ryle tube is inserted. All reflexes should be checked, and the patient should be carefully assessed by the staff nurses. In addition, the patient was given holistic care. After that, an intravenous line was inserted. Inj. Meropenem 320ml 8H, Inj. Fluconazole 100ml OD, Inj. Vit k 2.5ml stat, Inj. Vancomycin 160ml 6H, Inj. Pan 10ml OD, Inj. Levera 120ml 12H, Inj. Phenobarbitone 12H, Inj. Dexamethasone 8H 0.8ml, Inj. Neomol 100ml in SOS. All these medications were given as per the physician order. Anti-inflammatory drug side effects, particularly streptomycin-induced auditory and vestibular nerve toxicity and ocular complications, should be closely monitored. and the anti-inflammatory drugs should be taken according to the manufacturer's instructions.

Dexamethasone as a parental corticosteroid for one to two weeks can help reduce cerebral edema and prevent arachnoiditis with fibrosis. After that, oral steroids with prednisolone should be continued for 6-8 weeks before being gradually tapered off.

Mannitol (or glycerol or hypertonic glucose therapy) to lower Intra-Cranial Pressure, anticonvulsive drugs (diazepam, phenobarbitone) to control convulsions, and IV fluid therapy to treat dyselectrolytemia and maintain fluid-electrolyte balance are some of the other symptomatic treatments. To prevent Isoniazid side effects, pyridoxine (20 m) should be taken orally once a day (Isonicotinic acid hydrazide).[4]

At least four first-line drugs should be used in empiric treatment, preferably isoniazid, rifampin, pyrazinamide, and streptomycin or ethambutol; the role of fluoroquinolones is unknown. TBM mortality has been shown to improve with the addition of corticosteroids. Drug interactions are important treatment considerations in HIV-positive people with Tuberculous meningitis, Higher rates of drug-resistant tuberculosis, development of immune reconstitution inflammatory syndrome, and unclear benefit of adjunctive corticosteroids. To help determine the best treatment for drug-resistant Tuberculosis, animal models of experimental TBM should be used to test the efficacy of second-line and new anti-tuberculous drugs.[5]

NURSING MANAGEMENT:

Assess and record all vital signs during the admissions assessment. heart rate, blood pressure, respiratory rate, oxygen saturation, temperature, and pain are all important factors to consider. All of these baselines have been checked. Assess and record the level of consciousness and convulsion activity during a neurological examination. The fontanel was examined for fullness or bulging. analyzed the data and reported on the hydration level.

Examine your skin for any signs of a rash. Any type of inactive acute meningococcal disease that does not blanch. The patient was given intravenous fluid as per the doctor's orders. Positioning will have to change as well. Raise the bed's head to at least 300 degrees and keep it in a neutral position. Reduced anxiety about the disease's prognosis. as well as lowering the risk of complications. supportive nursing care, nutritional needs maintenance (Nasogastric tube feeding or oral feeding), and monitoring of complications, particularly daily measurements of head circumference to detect hydrocephalus, are all important measures. In some cases of hydrocephalus, a ventriculoperitoneal shunt may be necessary.[6]

Patients with Tuberculous meningitis should be monitored regularly to ensure that:

- No interruptions occur in treatment;

- Serious side-effects from the treatment are quickly identified;

- There is improvement in the patient’s condition, although this is often very gradual.

Home visits are the most effective way to get a complete picture of a patient's needs and progress. Many patients have other issues to deal with, such as housing or immigration issues, which are frequently their top priorities. Patients frequently require assistance to address these more immediate issues before beginning anti-tuberculosis treatment and attending hospital appointments. Social services, the Home Office, and the National Asylum Support Service may all be contacted by the nurse specialist. The nurse's role is critical in the treatment of tuberculosis (TB) and the successful completion of the patient's treatment. After a diagnosis has been made, the patient must be put on the appropriate treatment. Many patients find the treatment regimen challenging at first because they must take numerous tablets, some of which are quite large and have a variety of side effects. Later, when the patient's symptoms have subsided but the disease has not, they may question the need for continued treatment. Nurse specialists can ensure that patients are given the correct medication and can provide support for patients and their relatives or carers to prevent lapses in treatment. a specialist can help to manage side effects or drug formulations, take routine blood samples or occasionally arrange hospital admission.[7]

DISCUSSION:

A one-year-old boy was taken to Acharya Vinoba Bhave Rural Hospital with fever, irritability, vomiting, and Generalized Tonic-Clonic Seizure convulsions as his main complaints. Following the conclusion of the investigation and physical examination. Tuberculous Meningitis was later diagnosed. He did not respond to treatment and was admitted to the intensive care unit, where he was intubated and kept alive by a ventilator. and provide comprehensive nursing care until the end of his discharge. Tuberculous Meningitis was found to be particularly common in children and those infected with the human immunodeficiency virus in this study. MTB (Mycobacterium Tuberculosis) meningitis is the most dangerous manifestation of the disease, accounting for about 1% of all cases of active tuberculosis. In addition, 5 to 10% of extrapulmonary tuberculosis cases.

Many studies have looked at the treatment outcome for tuberculosis meningitis, but the results have varied due to differences in diagnostic criteria, treatment methods, study populations, and settings. Tuberculous Meningitis in children has a poor prognosis, according to a previous systematic review of research.

There are some limitations to this study. First, we only included studies published in English in this meta-analysis; eight studies published in other languages were not evaluated for full-

text reading. Second, studies with more than 10% of patients lost to follow-up were excluded. Even though these studies were not included, the treatment outcomes of patients with tuberculous meningitis were consistent with our findings. Third, the high mortality rate of tuberculous meningitis may be linked to a variety of factors, including disease stage, HIV co-infection, treatment delay, drug resistance, corticosteroid use, and stroke incidence. HIV co-infection, drug resistance, advanced stage of tuberculous meningitis at admission, and the incidence of stroke have all been linked in previous studies.

According to this study, 24 percent of tuberculous meningitis patients died during treatment. More importantly, our subgroup analyses revealed that mortality rose in tandem with disease severity. The treatment outcome was worsened by the severity of the disease. Patients with tuberculous meningitis who were HIV positive also had a higher mortality rate. In 2017, 9.2 percent of new tuberculosis cases (0.92 million) were HIV positive, with 0.3 million deaths attributed to co-infection, according to the WHO. Approximately 10.4 percent of patients with tuberculous meningitis tested positive for HIV, according to our findings. Patients with tuberculosis who were also HIV-positive were more likely to have a poor treatment outcome and die. According to our findings, half of the HIV-positive tuberculous meningitis patients died during treatment, which is significantly higher than HIV-negative patients (17.4 percent).

Meningitis is the most dangerous form of tuberculosis, especially in HIV-positive people. The high mortality rate associated with this disease can be dramatically reduced with early diagnosis and treatment. In general, treatment should last at least nine months and include at least four drugs that the Mycobacterium tuberculosis strain is known or suspected to be susceptible to. Adjunctive corticosteroid treatment should be considered, especially in people who are not infected with HIV. Treatment should be guided by Tuberculosis resistance patterns, especially in HIV-coinfected people who are at high risk of developing drug-resistant Tuberculosis. More research is needed to assess Cerebrospinal fluid penetration of newer Tuberculosis strains. agents to aid in the development of more effective treatment regimens for Tuberculous Meningitis that is both drug-susceptible and drug-resistant Furthermore, randomized controlled trials to optimize Multi-resistant Tuberculosis treatment are necessary to find the best possible drug combination and to standardize treatment.[5]

Tuberculosis killed approximately 1.6 million people in 2017, making it the deadliest infectious disease, killing more people than diseases related to the acquired immunodeficiency syndrome. Tuberculosis of the central nervous system is one of the deadliest forms of the disease. Tuberculous meningitis is diagnosed clinically and microbiologically Tuberculous Meningitis (TBM) is still a challenge and to standardize the

diagnosis and offer more reliable information to the decision-making process Predictive scores were developed and adapted for use in clinical practice in Brazil. The score's implementation will necessitate staff training, but it has the potential to reduce the time it takes to diagnose Tuberculous Meningitis and thus begin proper treatment sooner. However, to save time and resources, there is a need to expand access to the score and make it easier for physicians to use it. This study demonstrates the design and development of a multiplatform mobile application for calculating the tuberculous meningitis predictive score to aid clinical decisions. The preliminary findings revealed an effective and versatile App that can be used on a variety of devices and can be used in locations with limited or no internet access.[8]

CONCLUSION:

Tuberculosis continues to be a major global health issue. tuberculous meningitis treatment outcomes are poor, especially for patients with stage III disease or HIV co-infection. The low sensitivity of cerebrospinal fluid microscopy and the slow growth of Mycobacterium tuberculosis in conventional culture systems make an early diagnosis of tuberculous meningitis difficult. In the diagnosis of tuberculous meningitis, rapid, sensitive, and specific molecular detection methods should be widely used. Effective anti-tuberculosis and corticosteroid therapy are critical for tuberculous meningitis treatment outcomes.

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